# Introduction - Grade 4 Mathematics

The following released test questions are taken from the Grade 4 Mathematics Standards Test. This test is one of the California Standards Tests administered as part of the Standardized Testing and Reporting (STAR) Program under policies set by the State Board of Education.

All questions on the California Standards Tests are evaluated by committees of content experts, including teachers and administrators, to ensure their appropriateness for measuring the California academic content standards in Grade 4 Mathematics. In addition to content, all items are reviewed and approved to ensure their adherence to the principles of fairness and to ensure no bias exists with respect to characteristics such as gender, ethnicity, and language.

This document contains released test questions from the California Standards Test forms in 2003. First on the pages that follow are lists of the standards assessed on the Grade 4 Mathematics Test. Next are released test questions. Following the questions is a table that gives the correct answer for each question, the content standard that each question is measuring, and the year each question last appeared on the test.

The following table lists each strand/reporting cluster, the number of items that appear on the exam, and the number of released test questions that appear in this document.

| STRAND/REPORTING CLUSTER | NUMBER OF QUESTIONS ON EXAM | NUMBER OF RELEASED TEST QUESTIONS |
|---|---|---|
| Number Sense – Decimals, Fractions, and Negative Numbers | 16 | 4 |
| Number Sense – Operations and Factoring | 15 | 4 |
| Algebra and Functions | 18 | 4 |
| Measurement and Geometry | 12 | 3 |
| Statistics, Data Analysis, and Probability | 4 | 1 |
| TOTAL | 65 | 16 |

In selecting test questions for release, three criteria are used: (1) the questions adequately cover a selection of the academic content standards assessed on the Grade 4 Mathematics Test; (2) the questions demonstrate a range of difficulty; and (3) the questions present a variety of ways standards can be assessed. These released test questions do not reflect all of the ways the standards may be assessed. Released test questions will not appear on future tests.

For more information about the California Standards Tests, visit the California Department of Education's Web site at http://www.cde.ca.gov/statetests/star/ or http://www.cde.ca.gov/ta/tg/sr/resources.asp.

## THE NUMBER SENSE STRAND

In Grade 4, there are two reporting clusters within the Number Sense strand: 1) Decimals, Fractions, and Negative Numbers and 2) Operations and Factoring. This booklet contains released test questions for each of these clusters.

The following 10 California content standards are included in the Decimals, Fractions, and Negative Numbers reporting cluster of the Number Sense strand and are represented in this booklet by four test questions. These questions represent only some ways in which these standards may be assessed on the Grade 4 California Mathematics Standards Test.

### CALIFORNIA CONTENT STANDARDS IN THIS REPORTING CLUSTER

| **Number Sense** | |
|---|---|
| **Standard Set 1.0** | **Students understand the place value of whole numbers and decimals to two decimal places and how whole numbers and decimals relate to simple fractions. Students use the concepts of negative numbers:** |
| 4NS1.1* | Read and write whole numbers in the millions. |
| 4NS1.2* | Order and compare whole numbers and decimals to two decimal places. |
| 4NS1.3* | Round whole numbers through the millions to the nearest ten, hundred, thousand, ten thousand, or hundred thousand. |
| 4NS1.5 | Explain different interpretations of fractions, for example, parts of a whole, parts of a set, and division of whole numbers by whole numbers; explain equivalents of fractions (see Standard 4.0). |
| 4NS1.6 | Write tenths and hundredths in decimal and fraction notations, and know the fraction and decimal equivalents for halves and fourths (e.g., 1/2 = 0.5 or .50; 7/4 = 1 3/4 = 1.75). |
| 4NS1.7 | Write the fraction represented by a drawing of parts of a figure; represent a given fraction by using drawings; and relate a fraction to a simple decimal on a number line. |
| 4NS1.8* | Use concepts of negative numbers (e.g., on a number line, in counting, in temperature, in “owing”). |
| 4NS1.9* | Identify on a number line the relative position of positive fractions, positive mixed numbers, and positive decimals to two decimal places. |
| **Standard Set 2.0** | **Students extend their use and understanding of whole numbers to the addition and subtraction of simple decimals:** |
| 4NS2.1 | Estimate and compute the sum or difference of whole numbers and positive decimals to two places. |
| 4NS2.2 | Round two-place decimals to one decimal or the nearest whole number and judge the reasonableness of the rounded answer. |

* Denotes key standards (*Mathematics Framework for California Public Schools*)

The following six California content standards are included in the Operations and Factoring reporting cluster of the Number Sense strand and are represented in this booklet by four test questions. These questions represent only some ways in which these standards may be assessed on the Grade 4 California Mathematics Standards Test.

## CALIFORNIA CONTENT STANDARDS IN THIS REPORTING CLUSTER

| **Number Sense** | |
|---|---|
| **Standard Set 3.0*** | **Students solve problems involving addition, subtraction, multiplication, and division of whole numbers and understand the relationships among the operations:** |
| 4NS3.1* | Demonstrate an understanding of, and the ability to use, standard algorithms for the addition and subtraction of multidigit numbers. |
| 4NS3.2* | Demonstrate an understanding of, and the ability to use, standard algorithms for multiplying a multidigit number by a two-digit number and for dividing a multidigit number by a one-digit number; use relationships between them to simplify computations and to check results. |
| 4NS3.3* | Solve problems involving multiplication of multidigit numbers by two-digit numbers. |
| 4NS3.4* | Solve problems involving division of multidigit numbers by one-digit numbers. |
| **Standard Set 4.0** | **Students know how to factor small whole numbers:** |
| 4NS4.1 | Understand that many whole numbers break down in different ways (e.g., $12 = 4 \times 3 = 2 \times 6 = 2 \times 2 \times 3$). |
| 4NS4.2* | Know that numbers such as 2, 3, 5, 7, and 11 do not have any factors except 1 and themselves and that such numbers are called prime numbers. |

* Denotes key standards (*Mathematics Framework for California Public Schools*)

## THE ALGEBRA AND FUNCTIONS STRAND/REPORTING CLUSTER

The following seven California content standards are included in the Algebra and Functions strand/reporting cluster and are represented in this booklet by four test questions. These questions represent only some ways in which these standards may be assessed on the Grade 4 California Mathematics Standards Test.

### CALIFORNIA CONTENT STANDARDS IN THIS STRAND/CLUSTER

| **Algebra and Functions** | |
|---|---|
| **Standard Set 1.0** | **Students use and interpret variables, mathematical symbols, and properties to write and simplify expressions and sentences:** |
| 4AF1.1 | Use letters, boxes, or other symbols to stand for any number in simple expressions or equations (e.g., demonstrate an understanding and the use of the concept of a variable). |
| 4AF1.2* | Interpret and evaluate mathematical expressions that now use parentheses. |
| 4AF1.3* | Use parentheses to indicate which operation to perform first when writing expressions containing more than two terms and different operations. |
| 4AF1.4 | Use and interpret formulas (e.g., area = length × width or $A = lw$) to answer questions about quantities and their relationships. |
| 4AF1.5* | Understand that an equation such as $y = 3x + 5$ is a prescription for determining a second number when a first number is given. |
| **Standard Set 2.0*** | **Students know how to manipulate equations:** |
| 4AF2.1* | Know and understand that equals added to equals are equal. |
| 4AF2.2* | Know and understand that equals multiplied by equals are equal. |

* Denotes key standards (*Mathematics Framework for California Public Schools*)

## THE MEASUREMENT AND GEOMETRY STRAND/REPORTING CLUSTER

The following 15 California content standards are included in the Measurement and Geometry strand/reporting cluster and are represented in this booklet by three test questions. These questions represent only some ways in which these standards may be assessed on the Grade 4 California Mathematics Standards Test.

### CALIFORNIA CONTENT STANDARDS IN THIS STRAND/CLUSTER

| **Measurement and Geometry** | |
|---|---|
| **Standard Set 1.0** | **Students understand perimeter and area:** |
| 4MG1.1 | Measure the area of rectangular shapes by using appropriate units such as square centimeter ($cm^2$), square meter ($m^2$), square kilometer ($km^2$), square inch ($in^2$), square yard ($yd^2$), or square mile ($mi^2$). |
| 4MG1.2 | Recognize that rectangles that have the same area can have different perimeters. |
| 4MG1.3 | Understand that rectangles that have the same perimeter can have different areas. |
| 4MG1.4 | Understand and use formulas to solve problems involving perimeters and areas of rectangles and squares. Use those formulas to find the areas of more complex figures by dividing the figures into basic shapes. |
| **Standard Set 2.0*** | **Students use two-dimensional coordinate grids to represent points and graph lines and simple figures:** |
| 4MG2.1* | Draw the points corresponding to linear relationships on graph paper (e.g., draw 10 points on the graph of the equation $y = 3x$ and connect them by using a straight line). |
| 4MG2.2* | Understand that the length of a horizontal line segment equals the difference of the *x*-coordinates. |
| 4MG2.3* | Understand that the length of a vertical line segment equals the difference of the *y*-coordinates. |
| **Standard Set 3.0** | **Students demonstrate an understanding of plane and solid geometric objects and use this knowledge to show relationships and solve problems:** |
| 4MG3.1 | Identify lines that are parallel and perpendicular. |
| 4MG3.2 | Identify the radius and diameter of a circle. |
| 4MG3.3 | Identify congruent figures. |
| 4MG3.4 | Identify figures that have bilateral and rotational symmetry. |

| | |
|---|---|
| 4MG3.5 | Know the definitions of a right angle, an acute angle, and an obtuse angle. Understand that 90°, 180°, 270°, and 360° are associated, respectively with 1/4, 1/2, 3/4, and full turns. |
| 4MG3.6 | Visualize, describe, and make models of geometric solids (e.g., prisms, pyramids) in terms of the number and shape of faces, edges, and vertices; interpret two-dimensional representations of three-dimensional objects; and draw patterns (of faces) for a solid that, when cut and folded, will make a model of the solid. |
| 4MG3.7 | Know the definitions of different triangles (e.g., equilateral, isosceles, scalene) and identify their attributes. |
| 4MG3.8 | Know the definition of different quadrilaterals (e.g., rhombus, square, rectangle, parallelogram, trapezoid). |

* Denotes key standards (*Mathematics Framework for California Public Schools*)

## THE STATISTICS, DATA ANALYSIS, AND PROBABILITY STRAND/REPORTING CLUSTER

The following five California content standards are included in the Statistics, Data Analysis, and Probability strand/reporting cluster and are represented in this booklet by one test question. This question represents only one way in which these standards may be assessed on the Grade 4 California Mathematics Standards Test.

### CALIFORNIA CONTENT STANDARDS IN THIS STRAND/CLUSTER

| **Statistics, Data Analysis, and Probability** | |
|---|---|
| **Standard Set 1.0** | **Students organize, represent, and interpret numerical and categorical data and clearly communicate their findings:** |
| 4PS1.1 | Formulate survey questions; systematically collect and represent data on a number line; and coordinate graphs, tables, and charts. |
| 4PS1.2 | Identify the mode(s) for sets of categorical data and the mode(s), median, and any apparent outliers for numerical data sets. |
| 4PS1.3 | Interpret one- and two-variable data graphs to answer questions about a situation. |
| **Standard Set 2.0** | **Students make predictions for simple probability situations:** |
| 4PS2.1 | Represent all possible outcomes for a simple probability situation in an organized way (e.g., tables, grids, tree diagrams). |
| 4PS2.2 | Express outcomes of experimental probability situations verbally and numerically (e.g., 3 out of 4; 3/4). |

* Denotes key standards (*Mathematics Framework for California Public Schools*)

**1** **Which of these is the number 5,005,014?**

**A** five million, five hundred, fourteen

**B** five million, five thousand, fourteen

**C** five thousand, five hundred, fourteen

**D** five billion, five million, fourteen

**2** **What is 67,834,519 rounded to the nearest hundred thousand?**

**A** 67,000,000

**B** 67,800,000

**C** 67,830,000

**D** 67,900,000

**3** **Which fraction means the same as 0.17?**

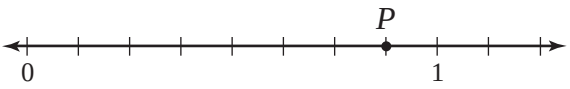
**A** $\frac{17}{10}$

**B** $\frac{17}{100}$

**C** $\frac{17}{1000}$

**D** $\frac{17}{1}$

**4** **What fraction is best represented by point *P* on this number line?**




**A** $\frac{1}{8}$

**B** $\frac{1}{5}$

**C** $\frac{3}{4}$

**D** $\frac{7}{8}$

**5** **5894 − 2608 =**

**A** 3276

**B** 3286

**C** 3294

**D** 3296

**6** **There are 58 cases of soda in a warehouse. If there are 24 cans of soda in each case, how many cans of soda are in the warehouse?**

**A** 1392

**B** 1362

**C** 1292

**D** 1262

**7** **There are 9 rows of seats in a theater. Each row has the same number of seats. If there is a total of 162 seats, how many seats are in each row?**

**A** 17

**B** 18

**C** 19

**D** 20

**8** **Which of these is another way to write the product 12 × 7?**

**A** 2 × 3 × 7

**B** 3 × 4 × 7

**C** 3 × 6 × 7

**D** 6 × 6 × 7

**9** **What is the value of the expression below?**

**(13 + 4) − (7 × 2)**

**A** 20

**B** 12

**C** 10

**D** 3

**10** **5 × (8 − 2) =**

**A** 25

**B** 30

**C** 38

**D** 42

**11** **The letters *S* and *T* stand for numbers. If *S* − 100 = *T* − 100, which statement is true?**

**A** $S = T$

**B** $S > T$

**C** $S = T + 100$

**D** $S > T + 100$

**12** **What number goes in the box to make this number sentence true?**

**(7 − 3) × 5 = 4 × □**

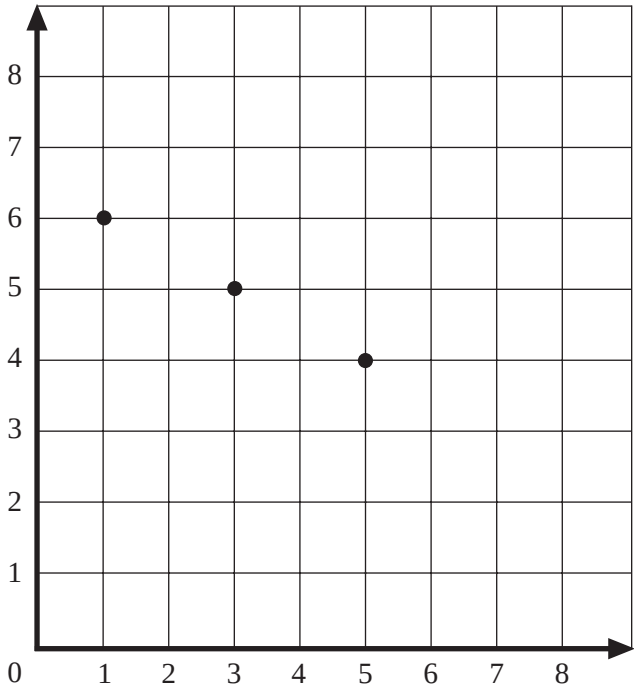
**A** 3

**B** 4

**C** 5

**D** 7

**13** **Chu plotted 3 points on a grid. The 3 points were all on the same straight line.**




**If she plots another point on the line, what could be its coordinates?**

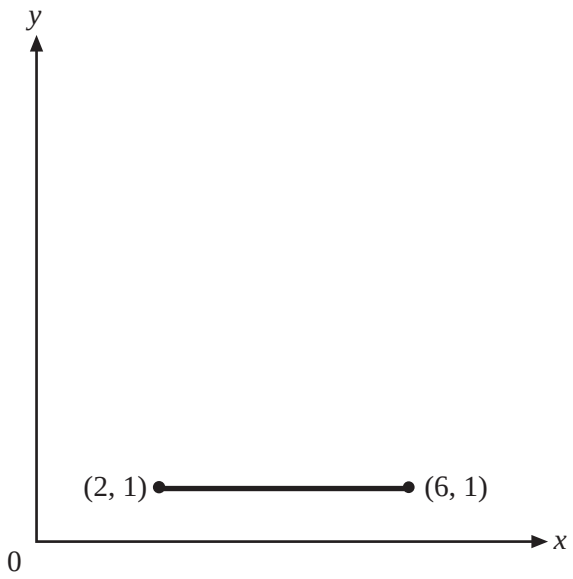
**A** (2, 5)

**B** (4, 4)

**C** (6, 3)

**D** (7, 3)

**14** **Look at the line segment shown below.**




**What is the length of the line segment?**

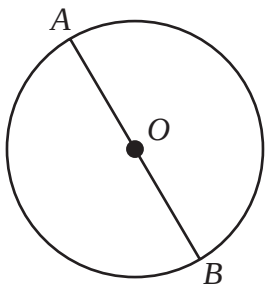
**A** 1 unit

**B** 2 units

**C** 4 units

**D** 6 units

**15** **Look at the circle with center *O*.**




**The line segment *AB* appears to be**

**A** an arc.

**B** a perimeter.

**C** a radius.

**D** a diameter.

**16** **Royce has a bag with 8 red marbles, 4 blue marbles, 5 green marbles, and 9 yellow marbles all the same size. If he pulls out 1 marble without looking, which color is he most likely to choose?**

**A** red

**B** blue

**C** green

**D** yellow

| Question Number | Correct Answer | Standard | Year of Test |
|---|---|---|---|
| 1 | *B* | 4NS1.1 | 2003 |
| 2 | *B* | 4NS1.3 | 2003 |
| 3 | *B* | 4NS1.6 | 2003 |
| 4 | *D* | 4NS1.9 | 2003 |
| 5 | *B* | 4NS3.1 | 2003 |
| 6 | *A* | 4NS3.3 | 2003 |
| 7 | *B* | 4NS3.4 | 2003 |
| 8 | *B* | 4NS4.1 | 2003 |
| 9 | *D* | 4AF1.2 | 2003 |
| 10 | *B* | 4AF1.3 | 2003 |
| 11 | *A* | 4AF2.1 | 2003 |
| 12 | *C* | 4AF2.2 | 2003 |
| 13 | *D* | 4MG2.1 | 2003 |
| 14 | *C* | 4MG2.2 | 2003 |
| 15 | *D* | 4MG3.2 | 2003 |
| 16 | *D* | 4PS2.2 | 2003 |